

Remarks

This application has been reviewed in light of the Nonfinal Office Action of August 16, 2007. Claims 1-6 and 8-24 are pending. Claims 1-6, 8-19, and 24 are rejected, and claims 20-24 are withdrawn. In response, claim 14 is amended; new claim 25 is added; and the following remarks are submitted. Reconsideration of this application, as amended, is requested.

Ground 1. Claims 1, 6 and 8-11 are rejected under 35 USC 103 over Vincent U.S. Patent 3,906,123 in view of Krockenberger U.S. Patent 3,438,914. Applicant traverses this ground of rejection.

MPEP 2142, under ESTABLISHING A PRIMA FACIE CASE OF OBVIOUSNESS, provides: "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. [Citations omitted]. See MPEP para 2143-2143.03 for decisions pertinent to each of these criteria."

First requirement--there must be an objective basis for modifying or combining the teachings of the references.

The first of the requirements of MPEP 2142 is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings." The present rejection is a §103 combination rejection. To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the

specification being examined. MPEP 2142, 2143 and 2143.01. See *also*, for example, In re Fine, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under §103 to establish a prima facie case of obviousness. [Citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)."

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"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also

suggests the desirability of the combination.” In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).”

“A statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).”

Here, there is set forth no valid objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure.

Vincent teaches a pressure-sensitive marking system that is applied over paper (col. 1, lines 10-19). Krockenberger teaches a water-based paint that is applied over certain types of wood to avoid a discoloration of the paint as a result of stain-through from the wood (col. 7, line 70-col. 8, line 2).

The argument for combining the teachings of the two references is “using a water-based paint system over previously painted or unpainted surfaces without fear of staining or discoloration of the paint,” referencing Krockenberger at col. 7, line 70-col. 8, line 2 (Office Action, page 3, lines 5-9). At the referenced location and elsewhere, Krockenberger does not teach the general application of his paint to “surfaces.” The teaching is limited to the surfaces of certain types of wood such as redwood and red cedar. There is certainly no indication in either reference that the marking system of Vincent suffers from a discoloration problem when applied over paper, or even that it can be or is applied to the redwood or red cedar materials of Krockenberger.

There is simply no basis for combining the teachings of these two references. They deal with utterly different technologies. Vincent deals with a pressure-sensitive marking system applied to paper, and Krockenberger deals with a paint applied to certain types of woods such as redwood and red cedar. Indeed, the stain-resistant

aspects of Krockenberger lead away from the pressure-sensitive color scheme of Vincent, which depends on readily visible color.

If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references, and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference. Thus, as it stands now, the invention as a whole is not prima facie obvious over the combined teachings of the prior art.

Second requirement--there must be an expectation of success.

The second of the requirements of MPEP 2142 is an expectation of success. There is no expectation of success...This requirement has not been addressed in the explanation of the rejection, and in any event more than Examiner's argument is required here. The proposed modification cannot render the reference inoperable or unsatisfactory for its intended purpose, MPEP 2142, 2143.01, and MPEP 2143.02.

As stated in MPEP 2142, "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. [Citations omitted]."

There is no teaching in either reference that the pressure-sensitive marking system of Vincent, which is taught for use with paper, may be used successfully on wood surfaces such as redwood or red cedar. There is no teaching that the paint composition of Krockenberger may be used successfully on paper to prevent staining of an overlying paint, which would otherwise occur with other paint compositions. There is no indication that the material of Vincent would even be operable with a drying oil or latex dispersion, a tannin precipitant, and a dye mordant present as required by the teachings of Krockenberger.

The explanation of the rejection has not even addressed the requirement of the expectation of success.

Third requirement--the prior art must teach the claim limitations.

The third of the requirements of MPEP 2142 is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." In this regard, the following principle of law applies to all §103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

This analysis is conducted mindful of the legal standard for a §103 rejection. Graham v. John Deere, 148 USPQ 459 (Sup. Ct., 1966) requires the following steps: (1) determine the scope and content of the prior art; (2) ascertain the differences between the prior art and the claims at issue; and (3) assess the level of skill in the art. Obviousness is determined against this background.

In determining obviousness, MPEP 706.02(j) requires (a) a statement of the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate, (b) a statement of the differences in the claim over the applied references; (c) the proposed modifications to the art reference to arrive at the claimed subject matter; and (d) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

Vincent teaches a three-layer system applied to paper, to make a pressure-sensitive record system (col. 1, lines 5-15). The first layer adjacent to the surface has an encapsulated color-reactant material, the second layer overlying the first layer is a pressure-rupturable barrier layer, and the third layer overlying the second layer has an absorbent electron-acceptor material. When a pressure such as produced by a pencil or pen is applied to the three-layer system and the support, the membranes rupture,

and the color-reactant material and the electron-acceptor material mix to produce color. This approach requires that three layers with separated, unmixed chemicals be sequentially applied to the surface of the support, as taught by Vincent (*see*, for example, claim 1 of Vincent, requiring that three layers be applied "in order." Mixing prior to application is not permissible, because the color-producing reaction would occur at the moment of mixing, not when pressure is applied with a pen or pencil.

Krockenberger teaches a paint used on certain types of wood such as redwood and red cedar (col. 7, line 70-col. 8, line 1), so that substances produced by the wood do not travel penetrate through the paint and stain its surface. Krockenberger requires a very specific composition including a vehicle that is a drying oil or an aqueous dispersion of latex, a tannin precipitant, and a dye mordant (claim 1 at col. 8, lines 11-22; col. 2, lines 12-42).

Claim 1 recites in part:

"preparing an indicator paint..., wherein the indicator paint comprises a mixture of a first reactant and a second reactant separated by a barrier that is rupturable so that the first reactant and the second reactant mix and produce the visible change when the indicator paint is subjected to the impact."

applying the indicator paint to the surface of the material..."

Amended claim 1 further recites in part:

"placing the material having the indicator paint thereon into circumstances where it may be subject to the mechanical impact."

The combination of teachings do not teach either of these limitations. Vincent does not teach preparing an indicator paint that is a mixture of a first reactant and a second reactant, and applying that indicator paint to the surface. Vincent applies a coating in three sequentially applied layers whose components are not mixed together. After the application, a force applied with a pen or pencil causes mixing and production of color. Vincent does not teach the use of an indicator paint in circumstances of mechanical impact. It is not clear even what Krockenberger is said to contribute to a teaching of the claim recitations. In the paragraph bridging pages 2-3 of the Office

Action, some features alleged to be provided by Krockenberger are described, but these features have nothing to do with the limitations recited in the claims. Neither of the references mentions "mechanical impact" at all. Nor is it clear what aspect of Krockenberger is to be used with Vincent to achieve the claimed invention. Clearly, the stain resistant paint of Krockenberger does not include the components of the first or third layer of Vincent, nor is there teaching in Krockenberger that the paint is pressure rupturable as required by the middle layer of Vincent.

At page 3, lines 5-6 of the Office Action, it is argued that it would be obvious to modify the teachings of Vincent with those of Krockenberger. Yet it is not stated how that combination would contribute to a teaching of the present claim limitations. Krockenberger requires the use of drying oil or latex dispersion, tannin precipitant and a dye mordant, but none of these substances is recited in the present claims. There is no indication that the material of Vincent would even be operable with a drying oil or latex dispersion, a tannin precipitant, and a dye mordant present. Penetration of substances from wood is not a consideration for Vincent's process or the presently claimed invention.

Claims 6 and 8-11 depend from claim 1 and incorporate its limitations.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Ground 2. Claims 2-5, 14-17, and 24 are rejected under 35 USC 103 over Vincent and Krockenberger, and further in view of Szweda U.S. Patent 5,488,017. Applicant traverses this ground of rejection.

First requirement--there must be an objective basis for combining the teachings of the references.

Applicant explained in the corresponding section of the Ground 1 rejection why there is no basis for combining the teachings of Vincent and Krockenberger.

Szweda teaches making a fiber-reinforced ceramic-matrix composite material. This ceramic composite material is not paper, as taught by Vincent, or a specific type of wood such as redwood or red cedar, as taught by Krockenberger. Neither Vincent nor Krockenberger teaches that its coating material is usable with a ceramic composite material as in Szweda. Szweda does not teach that coatings may be applied to the

ceramic composite material. Furthermore, Szweda is directed to a ceramic matrix composite for use in power generating engines operating at high temperatures, *see* col. 3 lines 15-20. The present invention uses modified versions of conventional paints, *see* para. [0016] and [0026], which will not survive high temperature environments (*i.e.* in excess of 700°F). All disclosed uses of the present invention (*see* e.g. para [0022]) are for low or ambient temperature applications.

The explanation of the rejection (Office Action, page 4, lines 3-7) refers to curbing undesirable porosity of the ceramic composite material of Szweda, but it is unclear what that has to do with the paper of Vincent, or with the redwood or red cedar of Krockenberger, or with the present claims. Further, Szweda teaches a ceramic matrix composite that controls porosity, (*see* col. 2 lines 58-63), as too much or too little is detrimental (*see* col. 3, lines 24-25).

Second requirement--there must be an expectation of success.

The references all teach specific materials: Vincent deals with paper, Krockenberger deals with redwood or red cedar, and Szweda deals with composite ceramic materials. There is no reason to believe that the teachings of one reference would be applicable to the conditions of one or both of the other references.

The explanation of the rejection has not even addressed the requirement of the expectation of success.

Third requirement--the prior art must teach the claim limitations.

Claim 1, from which claims 2-5 depend, recites in part:

“preparing an indicator paint..., wherein the indicator paint comprises a mixture of a first reactant and a second reactant separated by a barrier that is rupturable so that the first reactant and the second reactant mix and produce the visible change when the indicator paint is subjected to the impact”

applying the indicator paint to the surface of the material...”

Claim 1 further recites in part:

“placing the material having the indicator paint thereon into circumstances where it may be subject to the mechanical impact.”

The combination of teachings do not teach either of these limitations. Vincent does not teach preparing an indicator paint that is a mixture of a first reactant and a second reactant, and applying that indicator paint to the surface. Vincent applies a coating in three sequentially applied layers whose components are not mixed together. After the application, a force applied with a pen or pencil causes mixing and production of color. Vincent does not teach the use of an indicator paint in circumstances of mechanical impact. It is not clear even what Krockenberger is said to contribute to a teaching of the claim recitations. In the paragraph bridging pages 2-3 of the Office Action, some features alleged to be provided by Krockenberger are described, but these features have nothing to do with the limitations recited in the claims.

At page 3, lines 5-6 of the Office Action, it is argued that it would be obvious to modify the teachings of Vincent with those of Krockenberger. Yet it is not stated how that combination would contribute to a teaching of the claim limitations. Krockenberger requires the use of drying oil or latex dispersion, tannin precipitant and a dye mordant, but none of these substances is recited in the present claims. There is no indication that the material of Vincent would even be operable with a drying oil or latex dispersion, a tannin precipitant, and a dye mordant present. Penetration of substances made from wood is not a consideration for Vincent's process or the presently claimed invention.

Szweda teaches a ceramic composite material, but teaches nothing about the coating of the ceramic composite material in conjunction with the other limitations recited in claim 1. Given the high temperature uses of the Szweda composite, one skilled in the art would not expect such a teaching.

Claims 2-5 depend from claim 1, and are allowable because the references do not teach the limitations of claim 1. Additionally, none of the references teaches the “tensile elongation to failure of less than about 2 percent” limitation of claims 2-5, and none of the references teaches the recited “polymer-matrix composite material” limitation of claim 4. That Szweda discloses some stress-strain curves does not teach the limitation that a low-ductility material should be used in the present invention, or in the approaches of Vincent and/or Szweda.

Claim 14 recites in part:

"providing the composite material having a surface, wherein the composite material has a tensile elongation to failure of less than about 2 percent;"

Claim 14 further recites in part:

"preparing an indicator paint having an impact-sensitive component that changes color when subjected to a mechanical impact, wherein the indicator paint comprises a mixture of

a first reactant, and

a second reactant,

wherein the first reactant and the second reactant are separated by a barrier that is ruptured when the indicator paint is subjected to the mechanical impact;"

The references do not teach either of these limitations. Vincent does not teach preparing an indicator paint that is a mixture of a first reactant and a second reactant, and applying that indicator paint to the surface. Vincent applies a coating in three layers whose components are not mixed together. Vincent does not teach the use of an indicator paint in circumstances of mechanical impact. It is not clear even what Krockenberger is said to contribute to a teaching of the claim recitations. In the paragraph bridging pages 2-3 of the Office Action, some features alleged to be provided by Krockenberger are described, but these features have nothing to do with the limitations recited in the claims.

At page 3, lines 5-6 of the Office Action, it is argued that it would be obvious to modify the teachings of Vincent with those of Krockenberger. Yet it is not clear what that combination would provide that contributes to the rejection. Krockenberger requires that there tannin precipitant and a dye mordant be present, but neither of these substances is recited in the present claims. There is no indication that the material of Vincent would even be operable with a drying oil or latex dispersion, a tannin precipitant, and a dye mordant present.

Additionally, none of the references teaches the “tensile elongation to failure of less than about 2 percent” limitation of claim 14. That Szweda discloses some stress-strain curves does not teach the limitation that a low-ductility material should be used in the present invention, or in the approaches of Vincent and/or Szweda.

Claim 14 further recites in part:

“placing the composite material having the indicator paint thereon into circumstances where it may be subject to the mechanical impact;”

None of the references has any mention of mechanical impact, as far as Applicant can determine. The explanation of the rejection does not mention this limitation at all. If the rejection is maintained, Applicant asks that the Examiner point out where either of the references teaches about mechanical impact, or the use of an indicator paint on a composite material that may be subject to mechanical impact.

Claims 15-17 and 24-25 depend from claim 14, and are therefore allowable as well.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Ground 3. Claims 12, 13, 18, and 19 are rejected under 35 USC 103 over Vincent, Krockenberger, and Szweda, and further in view of Yamamura U.S. Patent 4,618,529. Applicant traverses this ground of rejection.

First requirement--there must be an objective basis for combining the teachings of the references.

Applicant discussed the absence of any basis for combining the teachings of Vincent, Krockenberger, and Szweda in relation to the Ground 2 rejection, and that discussion is incorporated here.

The explanation of the rejection (Office Action, page 5, lines 6-11) argues that the basis for combining the teachings of Yamamura is to achieve an improvement in inherent brittleness and non-uniformity in the mechanical strength of ceramics and composite materials that is suitable for use as a structure material. There is no explanation of why this teaching would have any relevance to paper as taught by

Vincent or certain types of wood as taught by Krockenberger, neither of which is a ceramic composite material.

Second requirement--there must be an expectation of success.

The explanation of the rejection does not mention this requirement at all.

And in any event, as pointed out above, Yamamura deals with ceramic composite materials, not paper as taught by Vincent or wood as taught by Krockenberger. There is no reason to believe that any teaching of Yamamura would have success in the context of paper and wood.

Third requirement--the prior art must teach the claim limitations.

Claims 12 and 13 depend from claim 1. Claims 18-19 depend from claim 14. The combination of Vincent, Krockenberger, and Szweda does not teach the limitations of the parent claims for the reasons discussed earlier and which are incorporated here, and Yamamura adds nothing in this regard. Yamamura has no teaching of indicator paints or the manner in which they are applied or used in impact circumstances.

Further, claims 12 and 18 each recites in part:

"determining a design limit for the composite material responsive to an observability of impact indications." [emphasis added]

Yamamura has no teaching or other mention of impact indications as recited. The explanation of the rejection references col. 6, lines 52-64 and Table 4 of Yamamura. At col. 4, lines 63-64, Yamamura clearly states that its critical stress intensity is measured by the indentation fracture method, which does not involve impact loading at all. In the indentation fracture method, an indenter is forced into the surface by non-impact techniques. The various quantities discussed in Table 4, flexural strength, degradation speed, reduction ratio, ratio of critical stress intensity factors, and thermal shock, have no relation to impact as recited in claims 1 and 18. The explanation of the rejection itself never makes any mention of impact indications as being found in the references, because there is no such discussion of any aspect of impact in the references.

Claims 13 and 19 each recites in part:

"determining a first design limit for the composite material in the event that it has the indicator paint applied thereto, and a second design limit for the composite material in the event that it has no indicator paint applied thereto."

None of the references teaches a first design limit and a second design limit as recited. Only Yamamura is even argued to relate to design limits. Without even arguing whether Yamamura relates in any way to design limits, Yamamura's property measurements are for the material only in a situation where there is no indicator paint applied, because Yamamura makes no mention of indicator paints. The explanation of the rejection itself never makes any mention of first and second design limits, other than to admit that they are not taught in the first three references, because there clearly is no such teaching in any of the references.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Applicant submits that the application is now in condition for allowance, and requests such allowance.

CONCLUSION

In view of the above, Applicant respectfully requests reconsideration of the Application and withdrawal of the outstanding objections and rejections. As a result of the amendments and remarks presented herein, Applicant respectfully submits that claims are not anticipated by nor rendered obvious by the cited art either alone or in combination and thus, are in condition for allowance. As the claims are not anticipated by nor rendered obvious in view of the applied art, Applicant requests allowance of all of the remaining claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant.

This Response has been filed within three (3) months of the mailing date of the Office Action and it is believed that no fees are due with the filing of this paper. In the event that Applicants are mistaken in their calculations, the Commissioner is hereby authorized to deduct any fees and credit any overpayments determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Applicant respectfully requests entry of the above amendment and allowance of the claims.

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